

DESCRIPTION

**Invention title.-**

INTERNAL DEVICE PROJECTOR OF IMAGES ON POLYHEDRONS WITH  
5 POLARIZABLE GLASS FACES AND PROJECTION PROCEDURE

**Background to the previous technical situation.-**

It is unknown so far in the background to the previous technical situation a device with a projector of images situated in the inner part of the smaller polyhedron of two or more hollow polyhedrons which are contained one another being inscribed but not conjugated  
10 or encapsulated with contact faces, since it is essential that there is enough distance between their faces so that an external spectator could appreciate the three-dimensional or space effect that is proposed and being the smaller one contained in the bigger that circumscribes it and this one successively in the next, all of them could be either concentric, in that case they would have the same centre, or could be leaned on a same  
15 base or each one could have different base in different levels, essentially characterised by being fitted each one with faces of translucent glass polarizable to transparent making it possible to project images in a successive way on every polyhedron, the inner one or any of the outer ones when the glass polarization is activated since on becoming transparent it allows to modify the glass screen where the image is projected by retro  
20 projection with a three-dimensional effect and with a demonstrative, advertising or exhibition purpose.

**Disclosure of the invention.-**

The proposed invention is a retro projection procedure and an appropriate device for its working, based on the retro projection of images on concentric or successive screens  
25 which are activated successively in order to fix the image of the projector on every screen since the screens consist of two sheets of glass or another transparent material

with a liquid between both sheets which is liable to conversion to transparent or translucent by electric polarization or depolarisation , so that the image stops reflecting on the screen when it is transparent and on the contrary the image is reflected on the one that is in translucent state, producing the effect of moving the space plane where the

- 5 image it is formed, approaching or moving off from the spectator and increasing or decreasing its size.

As a result the procedure is a system of images retro projection associated to the next technical characteristics:

- 1°.- The source of images will be placed inside the inner polyhedron of two or more hollow ones preferably regular with the same shape although irregular or with a different shape polyhedrons could be used if they are provided with lens, mirrors or auxiliary projectors of redirection of images situated in those faces of each polyhedron that are not used as screens in order to the auxiliary means are made invisible to the spectator.
- 15 2°.- The polyhedrons will be disposed in a way that each one is interior or inscribed in respect of the next one that circumscribes it with separation between its faces so that each polyhedron faces used as screens are parallel total or partially inscribed inside the luminic angle of projection of the images, though in certain cases the inscribed polyhedrons could be conjugated or have their faces in angle in respect of those of the circumscribed polyhedron in which case they will have to be associated to a complex system of lens, mirrors or another optical means which redirect by reflection the images to the next polyhedron or have auxiliary independent projectors, since the essential content of the new invention is the visual effect that is caused to the spectator by a multiscreen device in which each screen inscribed inside another bigger one or circumscribed to another smaller one could become transparent or translucent by
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modifying the special location of the same image in a three-dimensional system. As far as the present description is concerned, an inscribed polyhedron is defined as the one, which is contained in another bigger one that circumscribes it, similarly to what is said about a polygon inscribed inside a circumscribed polygon.

- 5 3º.- The polyhedron faces will be made of a special crystal, in glass, methacrylate or any other substance, characterised by being translucent under ordinary conditions, operating in this case to an external observer as a screen to retro project the images projected on it emitted from the inner part of the polyhedrons, or becoming transparent by polarization or another method when a light electrical current pass through it. In such a case the
- 10 images that appear from the device projector of images will pass through the transparent glass freely and they will project on the next polyhedron faces that are translucent, directly or by reflection of the image by means of lens or auxiliary mirrors, and they could also be emitted on the circumscribed polyhedron by means of independent auxiliary projectors, being essential that they are seen by an outside observer by retro
- 15 projection in one or another screen being contained each one in the bigger one, and that the screen where the images are projected could be modified at the choice of an operator or the spectator himself.

4º.- With a device of dynamic effect which modifies the polyhedrons translucent or transparent state by activating or deactivating the glass polarization, like a computer or

- 20 another system that regulates the electrical current of polarization of each polyhedron glasses, it will be possible to project images from the inside of them, successively on any of the faces of every polyhedron, depending on whether they are polarized or not, and thus each polyhedron could act in an independent way in a three-dimensional multiscreen system.

5º.- An auxiliary system of lens, mirrors or auxiliary independent projectors will have to make sure that the same image emitted by a projector or from an internal bunch of projectors is appropriately directed for its projection or it is projected from an auxiliary projector on each polyhedron faces.

5 6º.- The internal images projector in every case will remain concealed to the spectator just because there will always be between the spectator and the projector an activated screen with images projected on it that will prevent the projector from being seen. This one could be concealed as the case may require in order to make it disappear from the inner polyhedron in which is contained to make it invisible supposing that the operator 10 polarizes the faces of all the polyhedrons making them totally transparent.

7º.- The lens or auxiliary mirrors of redirection of images and as the case may be the independent auxiliary projectors, will be installed in one of the polyhedrons faces that is not used as a screen, so they stay concealed to the spectator sight on those polyhedrons faces that operate as screens.

15 The new invented device is a projector located in the inner polyhedron of two or more polyhedral bodies inscribed each one in the bigger one that contains it, concentric or not, provided with preferably parallel faces which are separated between them and inscribed into the emitter angle of projection of light, made of translucent polarizable crystal, either glass, methacrylate or any other material, provided with a system of lens 20 or multidirectional mirrors in order to allow the projection of the same image on all the faces of every glass polyhedron from the inside so that glass polarization and depolarisation allow the image to be seen in any of the glass polyhedrons by modifying its three-dimensional location in space simultaneously in all the polyhedron faces or in those selected as screens without the images projector is accessible to the eye of the 25 spectator since it is located inside and because an activated screen always exists

between the spectator and the projector or as the case may require by concealing the projector in order to make it disappear if all screens are polarized and made transparent. In that way a new device of projection with luminic, three-dimensional and dynamic effects, able of holding the spectator attention at high degree with an advertising, 5 didactic or entertainment purpose is obtained.

**Instructions as to the best way of bringing the invention into effect.-**

It is proposed as to the best way of bringing the invention into effect the construction of two hollow concentric cubes, with side faces of glass or multilaminar methacrylate provided within its sheets with a liquid polarizable under the action of a low-intensity 10 current that causes its transparency effect by polarization as the one used in any of the notorious patents or trademarks on the market in order to activate the transparency of translucent glass screens.

In the geometrical centre of those polyhedrons the system is provided with a projector or a bunch of images projectors which by means of a set of lens or mirror reflects the 15 same image on every face of the polyhedron where it is contained, being able of making it indifferently in the inner polyhedron if its glass faces are translucent in order to allow that the screen effect of the image is produced in them, or in case that the faces of that inner polyhedron are polarized and made transparent, they could project on those of the outer polyhedron or on the following one that will have been depolarised and 20 transformed to a translucent state with the same purpose, provided that the faces of the polyhedron placed in the middle as the case may be are in transparent state. In that way the same image could be seen in every face of each polyhedron, not only on the outer one but also on any of the inner ones, and so its projection could be alternated dynamically in each polyhedron with the effect of the modification of the three- 25 dimensional location of the images projected on all the faces of each one, without the

projector contained in the centre is visible, in order to hold intensely and with a new way the spectator attention with a didactic, advertising or entertainment aim.

The association of the device to a system of sensors (either of a luminic, acoustic or thermal nature) or as the case may require to a computer, allows that a programmed

5 sequence of projections by response to a stimulus as the mere presence of an spectator or any other stimulus that activates the sensors, is activated.

**Technical field.-**

The described invention has industrial application as projector with a didactic,

10 advertising or entertainment aim.

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